

CLAIMS

1. A speech-optimized information apparatus for speech-controlled interactive
5 applications, comprising:
 - a plurality of grammars for placing constraints on a sequence of words allowed in user utterances made in connection with user application interaction; and means for organizing said grammars to provide high recognition accuracy for said user utterances from a large and continually expanding set of words and
10 phrases without requiring users to provide samples of their voices ahead of time for training.
2. The apparatus of Claim 1, said plurality of grammars further comprising:
 - a user application interaction information space organized by information type.
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3. The apparatus of Claim 2, said information space further comprising:
 - means for allowing user accessible information to be linked or organized into a hierarchy; and
means for establishing a user chosen path to navigate through said
20 information.
4. The apparatus of Claim 1, wherein information in said grammars is used to carry out requests initiated by buttons on a remote control or other such device.
- 25 5. A method for speech control of interactive applications, comprising the steps of:
 - providing at least one speech-controlled application that uses a set of commands initiated by either speech or, optionally, by input from a device;

providing a set of grammars, composed of utterances, in which speech commands are specified, wherein said grammars comprise:

 a set of items, wherein each item comprises a word or phrase that can be spoken;

5 an associated set of attributes that provide more information about said item;

 an associated set of attributes that provide more information about said grammar as a whole; and

10 optionally, a name of a grammar that must be imported to complete an utterance.

6. The method of Claim 5, wherein at least one grammar comprises a command grammar for utterances that are used to control said application.

15 7. The method of Claim 5, wherein at least one grammar comprises an information-type specific grammar comprising multiple alternatives for a single piece of information.

20 8. The method of Claim 7, wherein said information-type specific grammar is linked to another grammar via a unique utterance (keyword) that distinguishes an information type from any other information type.

25 9. The method of Claim 8, wherein said information-type specific grammar comprises an attribute that specifies a keyword; and wherein items in said information-type specific grammar comprise an attribute that identifies said item's information type.

10. The method of Claim 5, further comprising the step of:

providing a chained command attribute indicates that an utterance in an item
is a part of a chained command;

wherein speech commands are chained together to provide one-step access

5 to information or application functionality.

11. A method for speech control of interactive applications, comprising the steps of:

providing a recognizer;

providing a command processor;

10 providing a context manager;

providing a data source;

said context manager communicating with said recognizer to activate
appropriate grammars for a current context;

said user speaking a command;

15 said recognizer returning said spoken command and all associated attributes
to said command processor;

said command processor accessing said data source, as necessary, to carry
out said command;

said command processor updating a current context; and

20 outputting results of said command.

12. A method for linking grammars into a hierarchy, comprising the steps of:

defining an utterance that links two grammars in two parts;

wherein a first part is a keyword, for information-type specific grammars, or a

25 command for command grammars; and

wherein contents of said grammar-to-be-linked are imported to include all alternatives for a second part of said utterance.

13. The method of Claim 13, wherein said grammars link information-type specific
5 information either explicitly or implicitly.

14. The method of Claim 13, wherein an application predetermines a navigation path and link in all appropriate grammars.

10 15. The method of Claim 13, wherein an application relies on type attributes returned to determine which options to make available to a user next.

16. An apparatus for speech control of interactive applications, comprising:
at least one speech-controlled application that uses a set of commands
15 initiated by either speech or, optionally, by input from a device;
a set of grammars, composed of utterances, in which speech commands are specified, wherein said grammars comprise:

a set of items, wherein each item comprises a word or phrase that can be spoken;

20 an associated set of attributes that provide more information about said item;

an associated set of attributes that provide more information about said grammar as a whole; and

25 optionally, a name of a grammar that must be imported to complete an utterance.

17. The apparatus of Claim 16, wherein at least one grammar comprises a command grammar for utterances that are used to control said application.

18. The apparatus of Claim 16, wherein at least one grammar comprises an information-type specific grammar comprising multiple alternatives for a single piece of information.

19. The apparatus of Claim 18, wherein said information-type specific grammar is linked to another grammar via a unique utterance (keyword) that distinguishes an information type from any other information type.

20. The apparatus of Claim 19, wherein said information-type specific grammar comprises an attribute that specifies a keyword; and wherein items in said information-type specific grammar comprise an attribute that identifies said item's information type.

21. The apparatus of Claim 16, further comprising:

a chained command attribute indicates that an utterance in an item is a part of a chained command;

20 wherein speech commands are chained together to provide one-step access to information or application functionality.

22. The apparatus of Claim 16, further comprising:

means for processing a "more like this" command for using a currently selected item type to decide where to look for information that a user wants.

23. An apparatus for speech control of interactive applications, comprising:

- a data source;
- a context manager, said context manager communicating with a recognizer to activate appropriate grammars for a current context;
- 5 a recognizer, said recognizer returning a spoken command and all associated attributes to a command processor;
- a command processor, said command processor accessing said data source, as necessary, to carry out said spoken command, said command processor updating a current context and outputting results of said command.

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24. The apparatus of Claim 23, wherein said spoken command effects any of:

- a targeted search;
- an exploratory search; and
- dynamic application generation.

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25. An apparatus for linking grammars into a hierarchy, comprising:

- at least one speech-controlled application that uses a set of commands initiated by either speech or, optionally, by input from a device;
- a set of grammars, composed of utterances, in which speech commands are specified, wherein said grammars comprise:
- 20 a set of items, wherein each item comprises a word or phrase that can be spoken;
- an associated set of attributes that provide more information about said item;
- 25 an associated set of attributes that provide more information about said grammar as a whole; and

wherein an utterance links two grammars in two parts:

wherein a first part is a keyword, for information-type specific grammars, or a command for command grammars; and

wherein contents of said grammar-to-be-linked are imported to include

5 all alternatives for a second part of said utterance.

26. The apparatus of Claim 25, wherein said grammars link information-type specific information either explicitly or implicitly.

10 27. The apparatus of Claim 25, wherein an application predetermines a navigation path and link in all appropriate grammars.

28. The apparatus of Claim 25, wherein an application relies on type attributes returned to determine which options to make available to a user next.

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29. The apparatus of Claim 25, further comprising:

means for processing a "more like this" command for using a currently selected item type to decide where to look for information that a user wants.

20 30. An apparatus for dynamically constructing a user interface for a speech-controlled application, comprising:

a plurality of grammars comprising a structure of speech commands for said application;

said grammars further comprising means for indicating when commands are chained;

25 means for parsing said grammars to obtain said structure; and

means for using said parsed structure to auto-generate at least some of said user interface for said application.